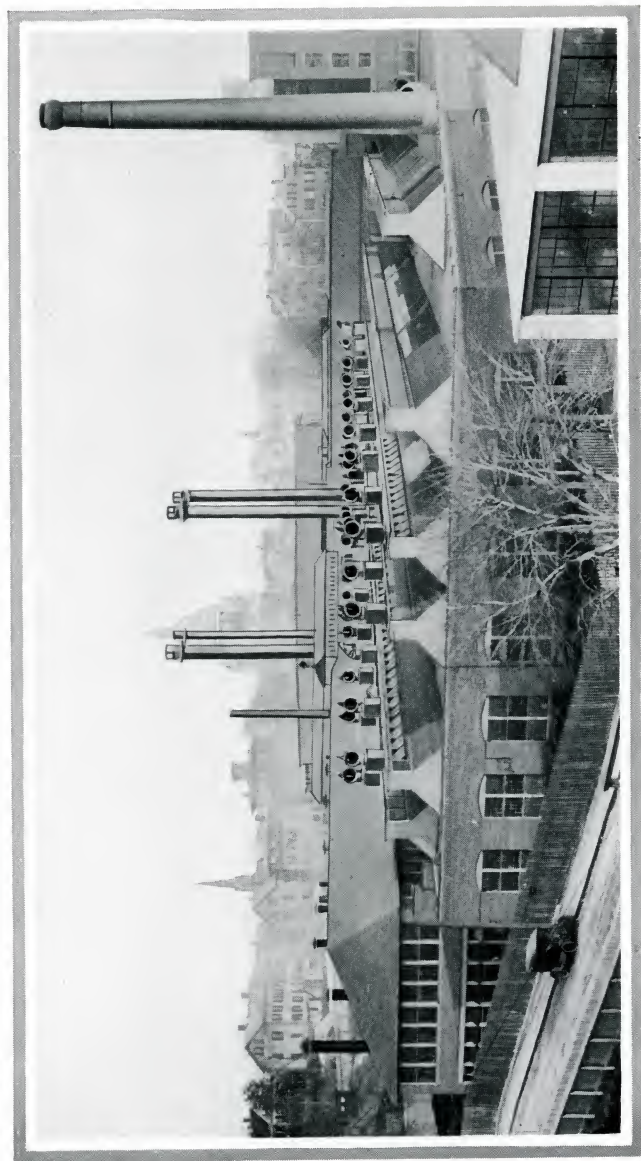


WHAT OUR FOUNDRY OFFERS THE BOY



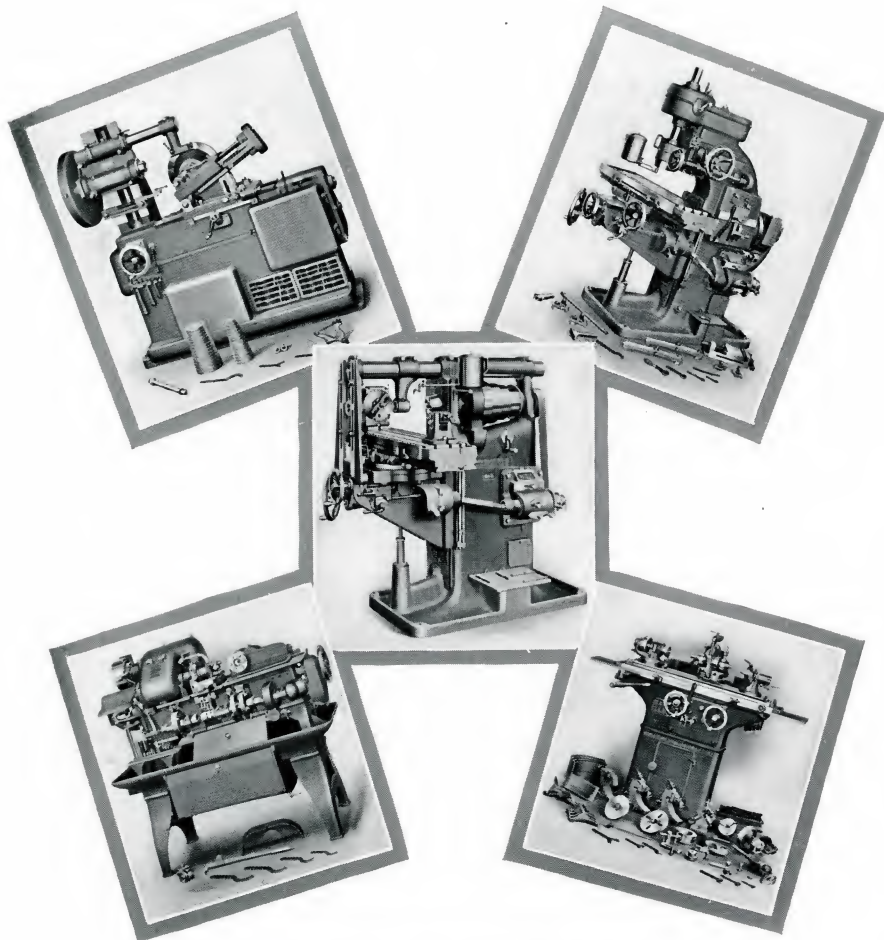
BROWN & SHARPE MFG. CO.
PROVIDENCE, R. I.





A corner of the Brown & Sharpe Foundry, showing the
dome of the State House in the background.

WHAT OUR FOUNDRY OFFERS THE BOY



The manufacture of these
Machine Tools is dependent upon
the moulder.



WHAT OUR FOUNDRY OFFERS THE BOY

In choosing a trade a boy should think of other things besides the money he will make while learning. He should be sure that it is a big trade, still growing, so that he can grow with it and get ahead. He should find out whether it is a "seasonable" trade—busy at one time of year and dull at another. He should see that it turns out things that people *must* have, and have all the time—not things that die out with a change of the public mind. He should be sure, too, that the place where he goes to learn his trade is the right kind, not only that it means well by him but that it really has the facilities for teaching him.

The Moulder's Trade

If you will stop a minute to think you will see that the iron moulder's trade is one of the biggest and most important in the world. The production of raw material, such as wheat, cotton and iron, is, as you know, the basis of all human existence and wealth. Without iron we would have no machines to weave our clothing, no machines to make our shoes or our hats, or our furniture, or to print our books and newspapers; no machines to sow and cultivate and reap and mill the grains that we must have to live; no locomotives to bring us the many things that we could not possibly get along without. We would not even have the lathes and the planers and the drilling machines to make all these others.

But the iron itself would do us little good if there were no men who knew the art of shaping it into loom frames, printing presses, steam engines and the like. Let us consider, for example, how much all of us depend upon the moulders who make just such things as the Brown & Sharpe foundry produces. Here we make castings for "machine tools", such as we have pictured, and for numerous other uses. "Machine Tools" make other tools and other pieces of machinery. They fashion pieces of iron and steel into useful things. Without them and others of their kind the locomotive cylinders, pistons, and a thousand other parts of the big freight engines that bring us nearly everything we use could not be made. We shall never be independent of the moulder and his art. Wisconsin wheat and Alabama cotton will do the people of New

England no good unless it can be brought to them; and it would be ridiculous to believe that we could ever again, with our rapidly increasing population, look to the horse and cart and the slow sailing vessel as the only means of transporting our goods.

But the locomotive is only one example of the importance of the foundry-man. We might go on and on with proof that, without the moulder, even our bare existence would be at stake.

A Growing Trade

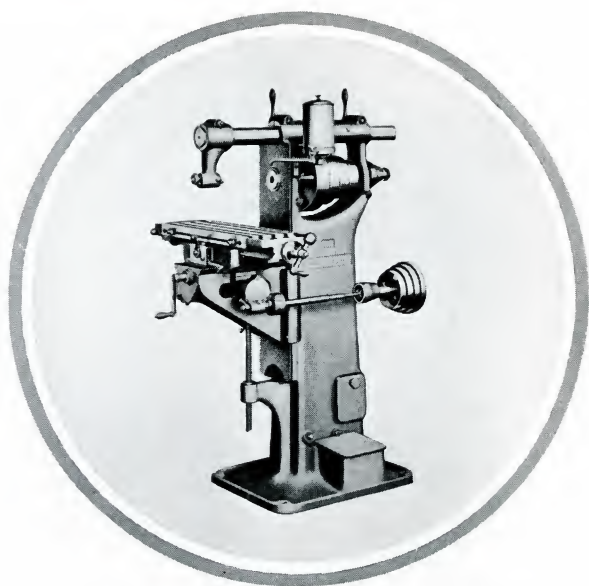
Years ago—'way back in our great-grandfather's time—the iron moulder's trade had already become an important one. In those days each individual was a good deal more independent of others than he is today. A good part of his food he grew himself; most of his clothes were spun at home on crude wooden wheels; he walked to his work and the shop that he worked in was probably run by water power. But not *all* of his food came from his own garden. Men who had learned the art of moulding were shaping iron into parts of marine engines, locomotives and freight car trucks to bring him the things that he couldn't raise. Cloth for his "Sunday suit" was made in a mill that required all sorts of iron castings, and when he went to the larger cities he rode on horse cars, many parts of which were produced in a foundry.

From our great-grandfather's day to ours there has been a great change in the importance and scope of the iron moulder's trade. There has been a rapid expansion of foundry work due to the invention of time and labor saving machinery and to the increasing demands of a progressive people. Where there was but one moulder fifty years ago there are many today, each one equipped with both methods and apparatus to turn out more and much better work.

The industries are each day doing something with machines that they did the day before by hand, and each new machine calls for numerous iron castings in its making. With the growth of the foundry business there must be a growth, both in numbers and in quality, of foundrymen. Where only one moulder is needed now there will be many needed in the future and where "rule of thumb" is permitted today there will be only standardized methods allowed.

More moulders will mean more foremen, more foundry instructors, more leaders in every department of the work.

As time goes on there will be a still greater field for the moulder and for the man, who, with a proper balance of head and hand training such as our apprentices receive, is able to take positions of greater responsibility.



On the following pages a series of photographs illustrate the various operations in the moulding and pouring of the frame for this milling machine.

What the Moulder Does

Many people have little or no understanding of the kind of work a moulder does, so we have pictured several stages in the making of a simple casting.

To one not at all acquainted with foundry work the making of a casting may appear from the pictures to be an easy thing to learn, but there is much in the way of fundamental knowledge, "tricks of the trade", "kinks", and dexterity of the hands that can be acquired only by thorough, systematic training. A good casting must not only be of the required shape; it must have the proper finish and strength, plus a margin for safety if it is to be used where a break might some day endanger life.

The fact that the moulder works in old clothes and uses materials that soil his hands gives those who do not understand the work the impression that he comes in the laborer's class. An acquaintance with the art proves that such is not the case. The moulder must be a skilled man—more skillful, in fact, than many who do a seemingly higher grade of work.

The Pattern



A wooden pattern, the shape and size of the desired casting, is made in halves. Here the apprentice is placing one-half of the pattern, flat side down, on a large wooden board. The other half of the pattern is shown standing near the apprentice's right hand. Other similar patterns can be seen in the background. Note the two iron boxes, called "flasks", on the horses at the left.



**Filling
the flasks**

After laying one-half of the pattern on the "board" one of the flasks, or iron boxes, is placed over it, fastened to the board and filled with moulding sand. This is much more than a shovelling process; it must be done in the right way.

Ramming the sand



When the flask has been filled the sand is made to set firmly around the pattern by "ramming" with an air rammer. The air rammer is illustrative of the modern equipment that is employed throughout our foundry, replacing to a considerable degree the muscle strength required of the old-time moulder.

**Drawing
the pattern**



The flask is then turned over, bringing the half pattern to the top side; the board is removed and the half pattern is carefully drawn out of the sand. White "facing" sand has been sprinkled over the dark sand shown in the preceding picture.

Smoothing the mould



This shows the impression that the half pattern leaves in the moulding sand. The apprentice is carefully smoothing the edge of the mould. This operation requires both "know-how" and expert handling of the tools.



**Closing
the flasks**

The same thing is done with the other half of the pattern, using the other iron box, or flask, and another board. Then the two flasks are placed together, leaving inside the whole impression of the piece to be made. The halves of the pattern just drawn from their respective flasks are shown at the right.

Pouring



A hole is made through the sand from the outside of the flask to the impression in the middle and molten iron is poured in until the space is filled. Each moulder directs the pouring of his own castings.



**The finished
casting**

When the iron has hardened the flasks are separated and the sand is knocked away, leaving the finished casting, which is then cleaned and seasoned. The cleaning is done by helpers, in a separate building.



There
are 624
Lockers
and 33
Shower
Baths



Interior of the foundry, showing light and
airy conditions, with traveling cranes to aid
in the work.

Where the Moulder Works

To most people the word "foundry" suggests the kind of place that nearly all foundrymen used to keep, and which, unfortunately, many keep now. Foundrymen, we must admit, have themselves been largely responsible for the impressions that the passer-by has gotten from foundry buildings and from the men coming out of them at the close of day.

A modern foundry, such as ours, is as far from the kind of place we are apt to think of as the up-to-date, sanitary dairy is from the old-fashioned cow shed.

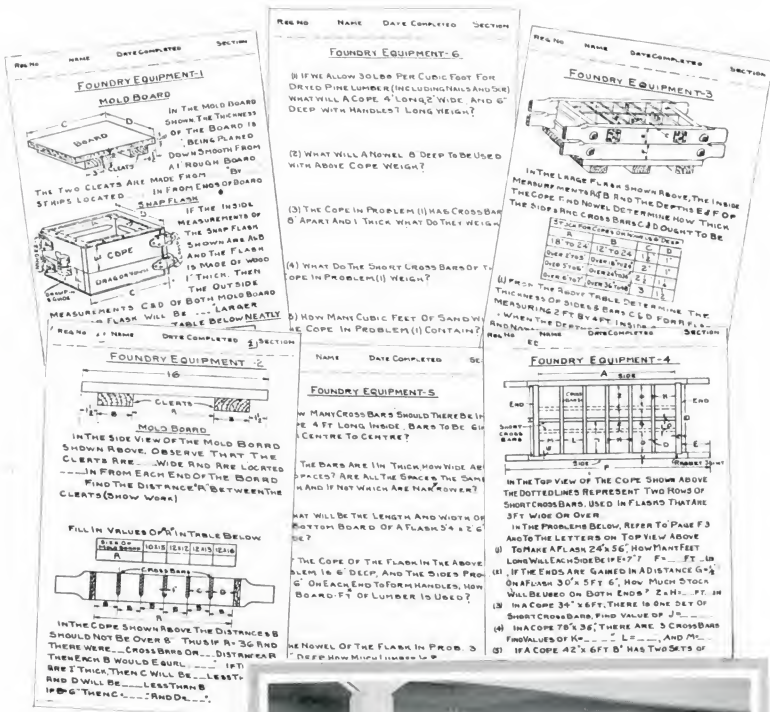
Formerly it was the universal custom to use the ground as a floor, and even today there are many foundries doing this. The Brown & Sharpe Mfg. Company's foundry was, so far as we know, the first in the country to have a concrete floor. Every section of our foundry buildings has been designed with the idea of maintaining light and airy workrooms, as clean and sanitary as it is possible to keep a place in which sand and iron are handled. Electric cranes, hand cranes and air rammers largely take the place of the muscle of the old-time moulder and helpers are at the call of the skilled man.

We would not have the reader infer that the moulder's work is the easiest in the world; or that everything is nowadays done for him by machinery. We look for a good, healthy body in an applicant for a foundry apprenticeship; but we would have it understood that the work of a moulder in our foundry is very different from that of one who works where lack of modern equipment means more time and more labor to get the same results.

Safety and Sanitation

Great care is taken in safeguarding foundry machinery, in the instruction as to safe methods of working and in maintaining a high standard from a sanitary standpoint. A well-equipped dispensary with physicians and nurses in attendance may be used by apprentices not only in cases of injury but for treatment of illness occurring while in the foundry.

One of the pictures shows our foundry locker room and shower baths. Here the apprentice, and the journeyman too, dons his shop clothes in the morning, leaving his better ones safe in his own locker. In the afternoon, when his moulds have been poured, he takes a shower of hot or cold water, changes again to his street clothes and goes home refreshed, and looking as well as if he worked in an office—probably *feeling* much better.



Typical school sheets and a corner of the class room.



Shop and School Plan

Apprentice systems should be judged individually—each on its own ability to teach a boy a trade, and to teach it well. Here an apprentice is treated not as an errand boy or handy man, but as a student. He is routed through the different kinds of foundry work, by the Apprentice Department, with as much care and thought for his trade education as would be given him in an engineering school. At the completion of each branch of the course a report is made by the foreman and the foundry instructor so that when he finishes his time of service a complete history of his apprenticeship is on file.

Particular attention is given to school work—not the kind of school work that many boys, unfortunately for themselves, have grown to dislike—but work of a purely practical nature, applied to the boy's every day needs in such a way that he sees it is part of the work. The apprentice learns how to apply figures to his job. He doesn't do percentage in banking terms but in terms of pig iron and coke. He doesn't draw a lot of things ordinarily found in a school drawing course—he learns practical foundry drafting and blue print reading.

Examples are selected from the actual work of the foundry, so that they are real problems which arise from day to day in connection with the ordinary requirements of the trade. All school work is in the form of separate lesson sheets on which the work is done by the apprentice and which he keeps as a reference book for use in later work.

A feature of the Brown & Sharpe system is the lecture plan. We believe that there are many things an apprentice should know that cannot be readily found in books or taught by the usual class method. Lectures, or "shop talks" illustrated by the stereopticon, are the means by which we have the boys learn the story of iron ore, new kinds of foundry equipment, safety methods, and many other things.

All school work is done during working hours, under the direction of instructors provided by the company, and apprentices are paid at their regular rates for the time spent in school.

Apprentice Department

All apprentice work is carried on through the Apprentice Department, under the direction of the Supervisor of Apprentices, who looks to the welfare of the boys outside as well as inside the foundry. The personnel of the department includes office assistants, class instructors and shop instructors. The shop instructors do not relieve the foremen of any responsibility in regard to the boys, but act as an additional help to both.



**The Providence
Y. M. C. A.**

**Apprentice
Baseball Team**



**The
Providence
Public
Library**

Apprentice Activities

We recognize the need of the right kind of physical and social development of young men and of their being broadened in ways that will tend to develop character, resourcefulness and initiative.

The Y. M. C. A. maintains a well-equipped gymnasium, swimming pool, shower baths, reading rooms, billiard rooms and clubs of different kinds.

We encourage the boys to take part in activities such as foot-ball, base-ball and basket-ball, and to become members of the Apprentice Athletic Association. Besides the Apprentice Department gymnasium events, the different shop departments compete each year for prizes in a general shop athletic meet, in which the apprentices show a keen interest.

To promote a spirit of thrift we advocate participation in the shop co-operative saving and insurance plan—a plan by which life insurance may be bought through the Company on an attractive basis and for small weekly payments. Many of our boys are members of the Brown & Sharpe Mutual Benefit Association, maintained for sickness and death benefits of its members. Savings societies, such as were made popular by the Government War Savings Stamps, offer an incentive to lay the foundation of a bank account.

The reading of technical magazines is strongly urged, and by systematic canvass a large number of the apprentices become subscribers to trade papers that are helpful in foundry work. There is an apprentice library, under the extension plan of the Providence Public Library, enabling the boys to borrow from a large and up-to-date collection of books on foundry practice and other subjects.

Living Conditions in Providence

As an aid to out-of-town boys who must wait for a vacancy in our Apprentice Home, we keep a registry of good rooming and boarding places near our works. A number of these are with private families—some in the homes of men long employed by us. The Providence Y. M. C. A. has a new building with dormitories and provides excellent opportunities for a wholesome social life for young men away from home. This institution has also an Educational Department, conducting evening classes along many helpful lines.

The Rhode Island School of Design, located in Providence, also holds out exceptional opportunities for evening study in mechanical drawing, mathematics and other lines of training for skill and proficiency in the arts and crafts. In addition, the high schools of the city conduct evening classes in drawing and mathematics which many of our employees attend.

It is our purpose not to confine ourselves to the education of the boy here in the foundry but to stimulate him to properly develop himself, educationally and otherwise, during his leisure time.

Reasons for an Apprenticeship Agreement

It is our intention to take only such boys as apprentices who really have a desire and a purpose to learn the trade, and we believe this end is more fully assured by entering into a formal agreement with specified conditions. We believe it to be far more important for the apprentice to have a thorough grounding in all branches of the trade during the period when he is under instruction than to confine him to one particular line of work, where, though his earning power for the time being might be greater, it would not assure the varied experience and training which are important if he is to rise to a position of responsibility and skill in later life.

We believe, also, in cases where a sum of money is paid for learning the trade, at the close of the trial period, when the contract is signed, that the agreement is given more serious consideration by both the boy and his parents, and that such a plan tends to keep out those applicants who simply "want a job" and have no special interest in learning the moulder's trade.

A boy without financial resources, but living at home, can, by saving his wages during the trial period, have a sum more than enough to pay his entrance fee when it becomes due.

In the case of a boy who finds it impossible to pay the fee outright, or whose parents are so situated that such payment would really be a hardship, we arrange for a part payment when the contract is signed and for the payment of the balance in weekly installments.

It is our purpose to so train boys that it will be of mutual benefit to have them stay with us. As a matter of fact, a very large percent do stay with the Company—at least for an appreciable time after the completion of their apprenticeship.

Trial Period

It will be noted from the "Terms of Apprenticeship", appearing on page 23, that the first three months constitute a trial period. If, at the end of this period, there is any doubt as to the fitness of the applicant for foundry work he is rejected. We hold that it is unjust to the boy as well as detrimental to our foundry to accept an applicant whom we feel is not suited for the trade.

If the applicant proves satisfactory during his trial and signs the agreement he buys a set of tools costing about \$20. This, like the \$25 fee, may be paid for on the instalment plan if desired.

Lines of Advancement

The moulder's trade offers an exceptional opportunity to get ahead—that is, to the young man with a thorough training. Many of the journeymen moulders of today learned their trade in a "hit or miss" fashion. Few, if any, foundries have given the needed attention to their training systems and as a result of this, foundry owners are going begging for men who know all sides of the business.

It has sometimes been pointed out to us that many moulders are simply moulders all their lives. We will admit that this is true but we would have it understood that moulding in itself, learned even as many present-day journeymen learned it, affords a week's pay considerably more than many men, leaders or foremen in their different lines, are getting in return for work which required much greater preparation. Some moulders prefer not to assume the responsibility that always goes with the more advanced positions, while others understand that an old-fashioned apprenticeship has put upon them certain limitations.

For the right kind of boy who graduates from our moulder's apprentice course we would predict a very bright future. To one unfamiliar with the iron industry it is difficult to point out the many ways in which the carefully trained boy can develop, but it is a fact well-known among men in the business that there are now, and always will be, good places waiting for good men.

Parents' Viewpoint

It often proves unfortunate for the boy, his employer and his parents that he has been influenced at home to seek the "nicer" lines of work. Parents, especially fathers, who have not had the advantages of a thorough, systematic training in their chosen trades are sometimes apt to think of their boys as simply following in their own footsteps and getting no higher unless they begin in an office, or somewhere beside a shop trade.

We would not have it understood that we believe this to be a universal feeling. On the contrary we believe that parents, and boys themselves, are more and more gaining an appreciation of the value of a trade training, leading to positions of responsibility in manufacturing industries.

How to become an Apprentice

If the applicant for an apprenticeship lives within twenty-five or thirty miles of Providence we prefer that he come here for a personal interview, and we are always glad to have him accompanied by his parents or guardian so that all concerned may have a first-hand understanding of the foundry work and terms of apprenticeship.

An applicant living at a considerable distance should send for an application blank. If, on the return of this form to us, the applicant is favorably considered for an apprenticeship we arrange to have him take the entrance examination in his own town under proper supervision.

The examination is in simple grammar school arithmetic and due consideration is given the boy who has been out of school a year or two and who has consequently forgotten some of his methods.

A successful applicant is usually started on his trial period within two or three weeks after the date of his examination.

Moulder's Apprenticeship Agreement

Following is the form of agreement entered into between the boy, his father or guardian, and the Company:

AGREEMENT made this.....day of.....
A. D. 19, between the BROWN & SHARPE MANUFACTURING COMPANY, a corporation established in the City of Providence, in the State of Rhode Island, party of the first part;(Name of Apprentice).....of
.....(Residence of Apprentice)....., party of the second part;
and(Father or Guardian of Apprentice).....of
.....(Residence)....., party of the third part.

WHEREAS the party of the second part is desirous of becoming an apprentice to the party of the first part, for the purpose of acquiring the art or trade of iron moulder.

NOW THIS AGREEMENT WITNESSETH:

That the party of the first part, in consideration of the covenants herein contained on the part of the party of the third part, hereby accepts the party of the second part as an apprentice in the art or trade of iron moulder, subject to and in accordance with the "Terms of Apprenticeship" which are given on the reverse of this agreement and made part hereof.

The party of the second part, in consideration of such acceptance, hereby agrees to become the apprentice of the party of the first part in the iron moulder's art or trade, in accordance with the said "Terms of Apprenticeship," and to faithfully conform to the provisions thereof.

The party of the third part, in consideration of the covenants on the part of the party of the first part herein contained, for himself, his heirs, executors and administrators, covenants with the party of the first part, that he will pay the party of the first part as compensation for receiving the party of the second part as an apprentice, the sum of twenty-five dollars (\$25.00)—said sum to be paid at the expiration of the term of trial referred to in said "Terms of Apprenticeship."

The party of the third part, for himself, his heirs, executors and administrators, covenants and agrees, to and with the party of the first part, that the party of the second part shall well and truly conform to and abide by all the provisions of said "Terms of Apprenticeship" and of this agreement.

The party of the first part covenants and agrees, in case the party of the second part shall serve the full term of said apprenticeship (including the making of lost time) as provided in said "Terms of Apprenticeship" and shall in all respects comply with the provisions of said "Terms of Apprenticeship," to pay to the party of the second part, at the termination of said term of apprenticeship, in consideration of such faithful service, the sum of one hundred dollars (\$100.00).

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals (the party of the first part by, its duly authorized for that purpose), the day and year first above written.

*Executed
in the presence of*

{
.....
.....
.....

This is to certify that(Name of Apprentice).....
has served his full term of apprenticeship according to the above agreement.

BROWN & SHARPE MFG. CO.

Date.....

Signed.....

Moulder's Terms of Apprenticeship

1. Applicants for admission to apprenticeship must be not less than seventeen nor more than twenty years of age. They must be physically sound, of good moral character, and have received an education equivalent at least to that required for graduation from the public grammar schools of the City of Providence.

2. If the applicant is accepted for trial his name will be registered and due notice given when he will be required to start.

3. The first six hundred hours (twelve weeks) of service shall constitute a term of trial. If the apprentice shall, during this term, prove satisfactory, and shall before the expiration thereof, execute, together with his father or guardian,—or if he have no father or guardian, then with some other responsible party,—an agreement in the form hereto annexed, then his apprenticeship shall date from the beginning of the term of trial and shall continue for the full term, unless sooner terminated as hereinafter stated.

4. Apprentices will be required to serve for the term of three years,—each year to consist of two thousand four hundred and fifty-five working hours, which with the usual working week of fifty hours, is equal to two hundred and ninety-five working days. The remaining working days in each year will be allowed apprentices for recreation, at such time or times as the Company shall direct.

5. Apprentices will be required to perform their duties with punctuality, diligence and fidelity, and to conform to the rules and regulations which are or may be adopted for the government of the foundry.

6. Apprentices are not allowed to use tobacco in the foundry during working hours.

7. Apprentices shall refrain from smoking cigarettes,—a practice generally regarded as harmful to health and efficiency. Indulgence in this practice may warrant the discharge of the apprentice.

8. Apprentices shall make up lost time at the expiration of each year, at the rate of wages paid during said year; and no year of service shall commence until the apprentice shall have fully made up all time lost in the preceding year.

9. The Company reserves the right, whenever the state of business demands it, to shorten the hours of labor, or whenever for any reason it shall stop the works, to suspend apprentices wholly or in part; and the making up of time so lost shall be at the discretion of the Company.

10. The Company also reserves the right, in its sole discretion, to terminate its agreement with any apprentice, also to discharge him from its employment for non-conformity with its rules and regulations, want of industry or capacity, indifference to his duties or improper conduct within or without the foundry.

11. Apprentices will be paid for each hour of actual service (not including time allowed for recreation or time when work is suspended) the following wages:—for the first year not less than _____ cents; for the second year not less than _____ cents; and for the third year not less than _____ cents. If the Company shall terminate the apprenticeship during the time of trial, it will pay at the first year rate for the time worked.

12. Wages will be paid on the regular pay-days of the Company, as they may be established from time to time.

13. The Company will faithfully instruct the apprentice in the iron moulder's art or trade, in their foundry, during the term of apprenticeship.

14. Graduates of a technical high school, well recommended by the principal, may have their term of apprenticeship shortened at the discretion of the Company.

(See insert, inside back cover, for present rates of pay.)

The Man with a Will

The business now conducted by Brown & Sharpe Mfg. Co. was founded in 1833. Ever since that time careful apprentice training has been held to be an important part of our business and a survey of the hundreds of our graduates would prove the value of such a training. Since we have an organization of over 7000 people, doing the largest machine tool manufacturing business in the world, we are always in a position to offer our graduates a place with us.

The young man with a will, with a purpose to forge ahead, who is not afraid of work and who is wise enough to see into the future can do no better than learn the moulder's trade. Today should be looked upon as counting toward tomorrow. The boy who is working along at a "job" should begin to think.

Many young men could go ahead if they would only make a start. Sending the application blank will be making YOUR start—and once a healthy, wide-awake boy makes a start he cannot be stopped. He is sure to get ahead.



The works of the Brown & Sharpe Mfg. Co., where about 200 apprentices are regularly being trained.



Apprentice Moulders' Pay

Moulders' apprentices are rated either "Regular" or "Good". Ratings are based on the work in the foundry, standing in classes, deportment, attendance, punctuality, etc. Those who are rated "Good" are rewarded by an hourly bonus as indicated.

(Cents per hour)			
	1st year	2nd year	3rd year
Regular	\$.28	\$.32	\$.38
Good30	.35	.41

On the basis of a 50-hour week the first year apprentice, with a "Regular" rating receives \$14 a week. The pay of a third year apprentice with a "Good" rating is \$20.50 a week.

